IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Michihisa TASAKA et al.

Serial No.: 09/384,380 Group Art Unit: 1713

Filed: August 27, 1999 Examiner: Rip A. Lee

For: FIRE-RETARDANT RESIN COMPOSITION AND MOLDED PART USING THE SAME

18/RD
4/30/03

DECLARATION UNDER 37 C.F.R. § 1.132

Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

I, Kazuhiko KOBAYASHI, declare and state that:

1. I am a Japanese citizen residing at 3-26-7, Sugita, Isogo-ku, Yokohama-shi, Kanagawa-ken, Japan.

I was graduated from Science & Engineering Section, CHUO University in March 1982.

I have been employed by RIKEN VINYL INDUSTRY CO., LTD. (whose name is changed to RIKEN TECHNOS CORPORATION as of October 1, 2001) since April 1982. I engaged in research and development of insulating-materials for electric wires at Compound Technical Department of the said company since April 1985. Further, I have been engaged in research and development of insulating-materials for electric wires in Polymer Application R&D Department at Material Research Center of the said company since April 1998.

I am intimately familiar with the contents of United States Patent Application Serial No. 09/384,380, filed on August 27, 1999,

its prosecution before the United States Patent & Trademark Office, and the references cited therein.

2. I have studied the contents of the cited Tasaka et al.'s U.S. Patent No. 5,929,165, Aida et al.'s U.S. Patent No. 5,221,781, and Nosu et al.'s U.S. Patent No. 6,218,454.

3. To show the superiority of the present invention, the following tests were conducted, by me or under my supervision:

Test

Resin compositions, Comparative examples 101, 102 and 103 were prepared in the same manner as in Example 10 in the present specification, except that the ratio of a magnesium hydroxide treated with vinyl silane to another magnesium hydroxide treated with aliphatic acid was changed, that no organic peroxide and no crosslinking aid were used, and that the ethylene/α-olefin copolymer was changed to another ethylene/α-olefin copolymer, respectively, as shown in Table A below .

That is, in Comparative example 101, 200 parts by weight of $Mg(OH)_2$ treated with vinyl silane and 300 parts by weight of $Mg(OH)_2$ treated with aliphatic acid were used, differing from Example 10. In Comparative example 102, no organic peroxide and no crosslinking aid were used, differing from Example 10. Further, in Comparative example 103, IDEMITSU MORETEC 0238N (trade name, manufactured by Idemitsu Petrochemical), which was ethylene/1-octene copolymer as a rather hard raw material synthesized in the presence of a multi site catalyst (MFR, 2 g/10

min; Density, 0.920 g/cm^3), was used, in place of the (c-1) in Example 10 synthesized in the presence of a single site catalyst.

From the thus-obtained resin compositions of Comparative examples 101, 102 and 103, 1-mm-thick sheets were formed respectively in the same manner as described in the EXAMPLES section (lines 11 to 13 on page 55) of the present specification.

In addition, from the resin compositions of Comparative examples 101, 102 and 103, insulated wires were prepared respectively in the same manner as described in the EXAMPLES section (from line 14, page 55, to line 10, page 56) of the present specification.

As to the sheets described above, the tensile properties (extension (elongation) (%) and tensile strength (MPa)) and the heat deformation property were tested, in the same manner as described in the EXAMPLES section (lines 19 to 24, page 56) of the present specification. The results are shown in Table A below.

As to the insulated wires described above, the tensile properties, abrasion resistance, the horizontal flame test, the 60°-inclined flame test, the heat deformation rate test, the whitening test (whether a whitening phenomenon was observed when bent), the extrudability test, and the flexibility test were carried out to test the covering layer of the insulated wire, in the same manner as described in the EXAMPLES section (from line 4, page 57, to line 3, page 61) of the present specification. The results are shown in Table A.

Table A

		Comparative example 101	Comparative example 102	Comparative example 103	Example 10
A	SEPS	100	100	100	100
B	Paraffin oil	40	40	40	40
c-1	Ethylene/α-olefin copolymer (ethylene/1-octene copolymer synthesized using single site catalyst) (Density, 0.870)	133	133	None	133
	Ethylene/α-olefin copolymer (ethylene/1-octene copolymer synthesized using multi site catalyst) (Density, 0.920)	None	None	133	None
d-2	Random polypropylene	33	33	33	33
E	Organic peroxide	0.66	0	0.66	0.66
F	Crosslinking aid	2	0	2	2
	Maleic acid-modified LLDPE	27	27	27	27
B-1	Kisma 5LH ($Mg(OH)_2$ treated with vinyl silane)	200	300	300	300
B-2	Kisma 5B ($Mg(OH)_2$ treated with aliphatic acid)	300	200	200	200
	Antioxidant	3	3	3	3
	Lubricant	6	6	6	6
Tests of the sheet	Extension (%)	460	480	400	390
	Tensile strength (MPa)	× 9.0	× 8.0	× 9.5	○ 12
	Heat deformation at 121 °C (%)	13	16	12.5	13
Tests of the insulated (electric) wire	Extension (%)	430	500	380	390
	Tensile strength (MPa)	× 9.3	× 8.5	× 9.6	○ 12
	Horizontal flame test	10/10	10/10	10/10	10/10
	60°-inclined flame test	10/10	10/10	10/10	10/10
	Abrasion resistance	○	○	○	○
	Whitening	×	×	×	○
	Heat deformation (%)	22	28	21	21
	Extrudability	○	○	×	○
	Flexibility	○	○	×	○

no x-linking agent

multisite catalyst

— difference between 103 and 10 were shown previously

— diff between 102 and 10 irrelevant since no x-linking

— diff between 101 and 10 are Mg(OH)2 ratios lead to difference in tensile strength & whitening

Note: Criteria of evaluation for the properties shown in Table A.

For sheets:

Extension; The value of 100% or more is required;

Tensile strength;

10 MPa or more: Good (designated "O"),

Less than 10 MPa: Not good (designated " × ");

Heat deformation; The value of 30% or less is required.

For insulated wires:

Extension; The value of 100% or more is required;

Tensile strength;

10 MPa or more: Good (designated "O"),

Less than 10 MPa: Not good (designated " × ");

Abrasion resistance; The number of movements of the blade was 1000 or more (designated "O"), until contacted the conductor;

Whitening;

No whitening occurrence after winding 6 times: Good (designated "O"),

Whitening occurrence after winding 6 times: Practically undesirable (designated " × ");

Heat deformation; The value of less than 50% is required;

Extrudability;

With a normal load, there is provided an extruded wire-like product having good outer appearance: Acceptable (designated "O"),

In spite of a conspicuously large load, there is not observed a good outer appearance because of granular structures, such as acne and blobbing on the extruded wire-like product: Practically unacceptable (designated " × ");

Flexibility;

The length of the end lowered from the original level was 3 cm or more: Good (designated "O"),

The length described above was less than 1 cm: Poor (designated " × ").

In the results of the horizontal flame test, the number of samples that passed the test (per 10 trials) were shown; and in the results of the 60°-inclined flame test, number of samples that passed the test (per 10 trials) were shown.

As is apparent from the results shown in Table A, the sheet prepared from the composition of Example 10 exhibited unexpectedly superior results with respect to tensile strength, compared with those, respectively, prepared from the compositions of Comparative examples 101, 102 and 103.

Further, as is apparent from the results shown in Table A, the insulated wire prepared by employing the composition of Example 10 exhibited unexpectedly superior results in tensile strength and whitening, compared with those prepared by employing the compositions of Comparative examples 101, 102 and 103.

Furthermore, as is apparent from the results shown in Table A, the insulated wire prepared in Example 10 exhibited unexpectedly superior results in tensile strength, whitening, extrudability and flexibility, compared with one prepared by the composition of Comparative example 103.

It is added that the wires prepared by employing the resin compositions of Comparative examples 101, 102 and 103, respectively, were conspicuously inferior in tensile strength and whitening compared with one prepared by employing the resin composition of Example 10.

To sum up, in every test for both of the sheet and the insulated wire, the composition of the present invention satisfied the criteria required and showed excellent performances in contrast with the compositions of comparative examples.

The data already of record in the specification and the supplemental data submitted herewith demonstrate unexpectedly superior results of the claimed fire-retardant resin composition, molded part, and method for processing fire-retardant resin composition over those of the cited prior art.

4. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: April 18, 2003

Kazuhiko Kobayashi

Kazuhiko KOBAYASHI